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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,041	02/13/2004	Maryellen L. Giger	248939US20	3848

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ALEXANDRIA, VA 22314

EXAMINER

WOLDEMARIAM, AKILILU K

ART UNIT	PAPER NUMBER
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2624

NOTIFICATION DATE	DELIVERY MODE
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02/04/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/777,041	Applicant(s) GIGER ET AL.	
	Examiner AKLILU k. WOLDEMARIAM	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 October 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-7,10,11,14-17,20,21,24-27 and 30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-7,10,11,14-17,20,21,24-27 and 30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>01/14/2008, 05/10/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The prior Non-Final rejection mailed on 07/07/2009 is withdrawn in light of the amendment to claims 1, 11 and 21.

Response to Amendment

2. Claims 1, 4-7, 11, 14-15, 21, 24-27 have been amended. Claims 1, 4-7, 10-11, 14-17, 20-21, 24-27 and 30 are still pending with, claims 1, 11 and 21 being an independent.

Response to Arguments

3. Applicant's arguments, see, pages 7-8 filed 10/07/2009, with respect to the rejection of claims 1, 4-7, 10-11, 14-17, 20-21, 24-27 and 30 under 35 U.S.C 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Giger et al. "Giger" (U.S. Publication 2003/0174873 A1). Therefore the arguments are moot.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 4-7, 10-11, 14-17, 20-21 and 24- 27 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giger et al. "Giger" (U.S. Publication 2003/0174873 A1) in view of Rogers et al., "Rogers" (U.S. Patent number 5, 671, 294).

Regarding claims 1 and 11, 21 , *Giger discloses* a method implemented by a computer programmed as an image processing device (*i.e., digital Mammogram input Unit*) that analyzes of a mammogram (mammogram) in digital form of a breast of a patient (*see abstract and fig.7*) and a computer readable medium storing instructions for execution on a computer system (*see paragraph [00263], ROMS, RAM or floppy disks*) comprising:

extracting from a selected region (ROI) of interest in the mammogram (*see item 811, fig.8A and paragraphs [0153], [0154]*) as inputs to at least one of a linear discriminant classifier and an artificial neural network classifier (*see paragraphs [0176], [0249], [0252] and [0253]*); and generating a risk marker indicative of a breast disease risk for said patient based on an output of the at least one of a linear discriminant classifier and an artificial neural network classifier (*see fig.8C and paragraphs [00252], [0253] and claims 2, 5, 8, 20*). a memory storing the mammogram in digital form (*see paragraph [0263] ROMS, RAM or floppy disks*).

Giger does not disclose plural surface area values or plural volume values calculated at corresponding plural scales associated with a texture of a parenchyma of the breast; applying, by the image processing device, said plural surface area values or said plural volume values directly.

However Roger discloses plural surface area values (*i.e., scale surface area as function of scale*) (*see col.5, line 59-col.6, line 25*) or plural volume values

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calculated at corresponding plural scales (*i.e., volume approximation at different scales*) associated with a texture of a parenchyma of the breast (see col.5, line 59-col.6, line 25).

applying, by the image processing device, said plural surface area values (*i.e., scale surface area as function of scale*) (see col.5, line 59-col.6, line 25) or said plural volume values (*i.e., volume approximation at different scales*) directly (see col.5, line 59-col.6, line 25).

It would have been obvious to ordinary skill in the art at the time when the invention was made to use Rogers's Plural surface area values in Giger's a method for a computerized analysis of a mammogram in digital form of a breast of a patient because it will allow to provide an image analysis system that will provide a cost efficient means for providing mammographic screening programs to large segments of the pollution, [Rogers, column 3, lines 3-6].

Regarding claim 4, *Roger discloses* the method according to Claim 1, wherein the extracting step comprises: extracting the plural surface area values from an area of the region of interest of the mammogram based on a box-counting method (*i.e., scale surface area as function of scale*) (see col.5, line 59-col.6, line 25 and *box counting method is well known in ordinary skill in the art*).

Regarding claim 5, *Rogers discloses* the method according to Claim 1, wherein the extracting step comprises:

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extracting the plural volume values from a volume of the region of interest of the mammogram based on a general Minkowski model (*i.e., volume approximation at different scales*) directly (*see col.5, line 59-col.6, and line 25*).

Regarding claim 6, Rogers discloses the method according to Claim 1, wherein the applying step comprises: applying the plural surface area values (*i.e., scale surface area as function of scale*) (*see col.5, line 59-col.6, line 25*) or the plural volume values features to a linear discriminant analysis classifier.

Regarding claim 7, Rogers *discloses* the method according to Claim 1, wherein the applying step comprises:

applying the plural surface area values (*i.e., scale surface area as function of scale*) (*see col.5, line 59-col.6, line 25*) or the plural volume values to an artificial neural network classifier.

Regarding claim 10, Giger *discloses* the method according to Claim 1, wherein the extracting step comprises: extracting from the mammogram a multi-fractal characteristic associated with the texture of the parenchyma of the breast (*see abstract and fig.8A*).

Regarding claim 14, Rogers *discloses* the system according to Claim 11, wherein the feature extraction mechanism extracts the plural surface area values (*i.e., scale surface area as function of scale*) from an area of the region of interest of the mammogram based on a box-counting method (*see col.5, line 59-col.6, line 25 and box counting method is well known in ordinary skill in the art*).

Regarding claim 15, *Rogers discloses* the system according to Claim 11, wherein the feature extraction mechanism extracts the plural volume values from a volume of the region of interest of the mammogram based on a general Minkowski model (*i.e., volume approximation at different scales*) (see col.5, line 59-col.6, line 25).

Regarding claim 16, *Giger discloses* the system according to Claim 11, wherein the classifier mechanism comprises a linear discriminant analysis classifier (see paragraphs [0176], [0247], [0252] and [0253]).

Regarding claim 17, *Giger discloses* the system according to Claim 11, wherein the classifier mechanism comprises an artificial neural network classifier (see paragraphs [0176], [0247], [0252] and [0253]).

Regarding claim 20, *Giger discloses* the system according to Claim 11, wherein the feature extraction mechanism extracts from the mammogram a multi-fractal characteristic associated with the texture of the parenchyma of the breast (*see abstract and fig.8A*).

Regarding claim 24, *Rogers discloses* the computer readable medium according to Claim 21, wherein the extracting step comprises: extracting the plural surface area values (*i.e., scale surface area as function of scale*) from an area of the region of interest of the mammogram based on a box-counting method (see col.5, line 59-col.6, line 25 and *box counting method is well known in ordinary skill in the art*).

Regarding claim 25, *Rogers discloses* the computer readable medium according to Claim 21, wherein the extracting step comprises:

extracting the plural volume values (*i.e., volume approximation at different scales*) from a volume of the region of interest of the mammogram based on a general Minkowski model (*see col.5, line 59-col.6, and line 25*).

Regarding claim 26, *Rogers discloses* the computer readable medium according to Claim 21, wherein the applying step comprises: applying the plural surface area values (*i.e., scale surface area as function of scale*) (*see col.5, line 59-col.6, line 25*) or the plural volume values features to a linear discriminant analysis classifier

Regarding claim 27, *Rogers discloses* the computer readable medium according to Claim 21, wherein the applying step comprises: applying the plural surface area values (*i.e., scale surface area as function of scale*) (*see col.5, line 59-col.6, line 25*) or the plural volume values features to an artificial neural network classifier.

Regarding claim 30, *Giger discloses* the computer readable medium according to Claim 21, wherein the extracting step comprises: extracting from the mammogram a multi-fractal characteristic associated with the texture of the parenchyma of the breast (*see abstract and fig.8A*).

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to AKLILU k. WOLDEMARIAM whose telephone number is (571)270-3247. The examiner can normally be reached on Monday-Friday 8:00 a.m-5:00 p.m EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bali Vikkram can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DANIEL G MARIAM/
Primary Examiner, Art Unit 2624

/A. k. W./
Patent examiner, Art Unit 2624
12/08/2009